

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A secondary battery comprising:

an integral generally hollow shaft;

first and second cells aligned axially along ~~[[a]]~~ the integral generally ~~cylindrical core~~ hollow shaft, each cell comprising:

a first generally cylindrical electrode of a first polarity disposed concentrically around said ~~core~~ integral generally hollow shaft and spaced a first distance from said ~~core~~ integral shaft;

a second generally cylindrical electrode of the first polarity disposed concentrically around said ~~core~~ integral generally hollow shaft and spaced a second distance from said ~~core~~ integral generally hollow shaft;

a third generally cylindrical electrode of a second polarity opposite said first polarity disposed concentrically around said ~~core~~ integral generally hollow shaft and spaced a third distance from said ~~core~~ integral generally hollow shaft;

a fourth generally cylindrical electrode of the second polarity disposed concentrically around said third electrode and spaced a fourth distance from said ~~core~~ integral generally hollow shaft; and

a plurality of generally cylindrical separators disposed between said respective electrodes, separating said first, second, third, and fourth electrodes, respectively, from one another; and

wherein at least one electrode of the first polarity in the first cell has a first edge extending from an end of said first cell, said first edge curving in a first direction, and at least one electrode of the second polarity in the second cell has a second edge extending from an adjoining end of the second cell, said second edge curving in a second direction opposite the first direction, said first and second edges overlapping and being in electrical contact with one another.

2. (Previously Presented) The secondary battery according to claim 1, wherein the first electrodes and the second electrodes are offset from one another in a direction in which the first cell and second cell are aligned.

3. (Previously Presented) The secondary battery according to claim 1, wherein the electrodes are wound.

4. (Cancelled).

5. (Cancelled).

6. (Previously Presented) The secondary battery according to claim 1, wherein the first edge portion of the first electrode extending from the first cell and the second edge portion of the second electrode extending from the second cell are joined by crimping.

7. (Original) The secondary battery according to claim 1, wherein the secondary battery further comprises a ring member, and the edge portion of the first electrode in the first cell and the edge portion of the second electrode in the second cell are joined by pressure from the ring member.

8. (Previously Presented) The secondary battery according to claim 1, wherein the first edge portion of the first electrode extending from the first cell and the second edge portion of the second electrode extending from the second cell are joined by welding.

9. (Previously Presented) The secondary battery according to claim 1, wherein the secondary battery further comprises a case which encloses the first and second cells, and the first edge portion of the first electrode extending from the first cell and the second edge portion of the second electrode extending from the second cell are joined by pressure applied exterior to the case from the outside.

10. (Withdrawn) A manufacturing system for manufacturing a secondary battery, comprising:

a forming apparatus that forms a first cell comprising a flat sheet-shaped first electrode of one polarity and a flat sheet-shaped second electrode of another polarity layered on top of one another with a separator disposed therebetween; and

a moving apparatus that moves the first cell with respect to the forming apparatus so that the forming apparatus can form a second cell comprising a flat sheet-

shaped first electrode of one polarity and a flat sheet-shaped second electrode of another polarity layered on top of one another with a separator disposed therebetween, such that an edge portion of the second electrode in the second cell, which has a different polarity than an edge portion of the first electrode in the first cell, is overlapped with the edge portion of the first electrode in the first cell, and the secondary battery has a shape in which the first cell and the second cell are aligned in one direction.

11. (Withdrawn) The manufacturing system according to claim 10, wherein the shape of the first electrode and the shape of the second electrode are the same, and the forming apparatus forms the first cell and the second cell by layering the first electrode and the second electrode on top of one another and offset from one another in the one direction.

12. (Withdrawn) The manufacturing system according to claim 10, wherein the forming apparatus forms the first cell and the second cell by winding the layered electrodes.

13. (Withdrawn) The manufacturing system according to claim 12, wherein the secondary battery is a battery which includes a shaft-shaped member and the forming apparatus forms the first cell and the second cell by winding the layered electrodes around the shaft-shaped member.

14. (Withdrawn) The manufacturing system according to claim 10, wherein the manufacturing system further comprises a joining apparatus for joining the edge portion of the first electrode in the first cell and the edge portion of the second electrode in the second cell at a portion where those two edge portions overlap.

15. (Withdrawn) The manufacturing system according to claim 14, wherein the secondary battery is a battery in which the first and second cells is housed in a case, and the joining apparatus joins the edge portion of the first electrode in the first cell and the edge portion of the second electrode in the second cell at a portion where those two edge portions overlap by pressing on the case from the outside.

16. (Withdrawn) A manufacturing method of a secondary battery, comprising:
a first forming step for forming a first cell comprising a flat sheet-shaped first electrode of one polarity and a flat sheet-shaped second electrode of another polarity layered on top of one another with a separator disposed therebetween; and
a second forming step for forming a second cell comprising a flat sheet-shaped first electrode of one polarity and a flat sheet-shaped second electrode of another polarity layered on top of one another with a separator disposed therebetween, such that an edge portion of the second electrode in the second cell, which has a different polarity than an edge portion of the first electrode in the first cell, is overlapped with the edge portion of the first electrode in the first cell, and the secondary battery has a shape in which the first cell and the second cell are aligned in one direction.

17. (Withdrawn) The manufacturing method according to claim 16, wherein the first forming step forms a plurality of the first cells at predetermined intervals in the one direction.

18. (Withdrawn) The manufacturing method according to claim 16, wherein the shape of the first electrode and the shape of the second electrode are the same, and in the first forming step and the second forming step, the first cell and the second cell are formed by layering the first electrode and the second electrode on top of one another and offset from one another in the one direction.

19. (Withdrawn) The manufacturing method according to claim 16, wherein in the first forming step and the second forming step, the first cell and the second cell are formed by winding the layered electrodes.

20. (Withdrawn) The manufacturing method according to claim 19, wherein the secondary battery is a battery which includes a shaft-shaped member, and the first cell and the second cell are formed by winding the layered electrodes around the shaft-shaped member.

21. (Withdrawn) The manufacturing method according to claim 16, further comprising a joining step for joining the edge portion of the first electrode in the first cell and the edge portion of the second electrode in the second cell at a portion where those two edge portions overlap.

22. (Withdrawn) The manufacturing method according to claim 21, wherein the secondary battery is a battery in which the first and second cells is housed in a case, and in the joining step, the edge portion of the first electrode in the first cell and the edge portion of the second electrode in the second cell at a portion where those two edge portions overlap are joined by pressing on the case from the outside.

23-24. (Cancelled).

25. (Currently Amended) The secondary battery according to claim 1, wherein the ~~core~~ integral generally hollow shaft is configured to route a cooling fluid therethrough.

26. (Previously Presented) The secondary battery according to claim 1, further comprising a generally cylindrical outer casing and an insulation sheet.

27. (Previously Presented) The secondary battery according to claim 1, wherein said third distance is greater than said first distance.

28. (Previously Presented) The secondary battery according to claim 1, wherein said fourth distance is greater than said first distance.

29. (Currently Amended) A secondary battery comprising:

an integral generally hollow shaft;

first and second adjacent cells aligned axially along ~~[[a]]~~ the integral generally cylindrical ~~core~~ hollow shaft, each cell comprising:

a first generally cylindrical electrode of a first polarity disposed concentrically around and spaced a first distance away from said ~~core~~ integral generally hollow shaft; and

a second generally cylindrical electrode of a second polarity opposite said first polarity disposed concentrically around said ~~core~~ integral generally hollow shaft and spaced a second distance away from said ~~core~~ integral generally hollow shaft;

wherein said second distance is different from said first distance; and

wherein the first generally cylindrical electrode of the first polarity in the first cell has a first edge extending from a first end of said first cell, and curving in a first direction, and the second generally cylindrical electrode of the second polarity in the second cell has a second edge extending from a second end of the second cell adjacent the first end of the first cell, and curving in a second direction opposite the first direction, said first and second edges overlapping and being in electrical contact with one another.

30. (Previously Presented) The secondary battery of claim 29, further comprising separators between said first and second electrodes.

31. (Previously Presented) The secondary battery of claim 29, wherein said second distance is greater than said first distance.

32. (Previously Presented) The secondary battery of claim 29, wherein said second distance is less than said first distance.

33. (Currently Amended) The secondary battery of claim 29, further comprising a third electrode of one of the first and second polarities provided concentrically around said ~~core~~ integral generally hollow shaft, and spaced a third distance away from said ~~core~~ integral generally hollow shaft.

34. (Currently Amended) The secondary battery of claim 33, further comprising a fourth electrode of one of the first and second polarities, opposite the plurality of the third electrode, provided concentrically around said ~~core~~ integral generally hollow shaft, and spaced a fourth distance away from said ~~core~~ integral generally hollow shaft.

35. (Currently Amended) A secondary battery comprising:
an integral generally hollow shaft;
a plurality of cells aligned axially along ~~[[a]]~~ said ~~core~~ integral generally hollow shaft ~~adjoining one another in series~~, each cell comprising:
a first electrode of a first polarity wound around the ~~core~~ integral generally hollow shaft;
a second electrode of a second polarity, opposite the first polarity, wound around the ~~core~~ integral generally hollow shaft;

a spacer between the first and second electrode, wound around the ~~core~~
integral generally hollow shaft and electrically separating the first and second
electrodes;

wherein the first electrode in one cell has a first edge, extending from an
end of the cell, and curving in a first direction, and the second electrode in the adjoining
cell has a second edge extending from the cell, and curving in a second direction
opposite the first direction, the first and second edges overlapping and being in
electrical contact with one another.